

Work Order ID 60815

Friday, July 23, 2010 10:24:20 AM



Page 1

Item ID: D350-748-101

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Installation, High Fwd

Start Date: 7/23/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 8/16/2010 Req'd Qty: 1.00

Customer:

Reference:

Approvals:

Process Plan:

*H*Date: *10-7-23*

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start



Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

Draw Nbr

Revision Nbr

D350-748-141

Rev E

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile & type labels per PPPD350-748-101

CHG001

5/6/09/20

110

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT *22**DP**10-8-18**Plb ->*

120

0.00



QC15- Crosstube Dimensional Check

QC

Memo

0.00

Quality Control

*S. 10/08/20**10**W*

Dart Aerospace Ltd

W/O: 60815		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
10/04/20	#115	Perm. change Add step for stress relief steel cross tubes Per Q57 010.	[Signature]	10-09-21			S 10/06/20	
10/08/20	#115	Stress relief cross tubes per Q57 010 temp <u>350°F</u> Start time <u>7:00AM</u> Fin time <u>11:AM</u>	[Signature]	10-8-19			S 10/08/20	

Part No: D350-748-101 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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NOTE: Date & initial all entries



- 4.2.3.12 Slide mandrel on top of both V-blocks and through bracket.
- 4.2.3.13 Tighten both nuts in an equal manner so that there is no play/movement in the mandrel.
- 4.2.3.14 Place buggy in proper orientation per bender folio.

4.3 CROSSTUBE STRESS RELIEF (STEEL)

- 4.3.1 Stress relief shall be performed as soon as possible after bending:
 - 4.3.1.1 Place Crosstubes in the oven vertically (as installed on the aircraft)
 - 4.3.1.2 Heat crosstubes at 375 deg F for 4 hours
 - 4.3.1.3 Allow to cool at room temperature

REFERENCE ONLY

4.4 DT8577A TABLE SETUP FOR ASSEMBLY

- 4.4.1 Remove all bolts (2 per support) in both support stands.
- 4.4.2 Remove both support stands from previous location and place in proper hole location using the hole location chart for DT8577A.
- 4.4.3 Ensure cuff supports provide stability for crosstube during assembly in proper hole location.
- 4.4.4 Tighten all bolts (2 per support).
- 4.4.5 Make sure that painted supports are used for Support/Abrasion Strip installation.
- 4.4.6 Use proper support locating jigs for correct crosstubes. Check with blueprints for correct angles needed.
- 4.4.7 Use correct Abrasion strip locating tools for correct crosstubes.

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	Crosstubes	0.00							
Crosstubes									
Crosstubes									
	Memo	0.00							
	1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B & C Drill Jigs, Set-up drill table as per QSI 010								
	2-Deburr								
	3-Engrave Part # and Batch # as per Dwg D350-748-141								
	4-Remove all marks from tube within limits of D350-748-141								
	5- Apply a light coat of LPS3 on the interior of tube Batch: 1109956								
	QC5- Inspect part completeness to step on W/O	0.00							
140									
QC									
Quality Control									
	Memo	0.00							
	CHECK 10 DEG HOLES WITH DT8876E (EUROCOPTER CLAMP)								

DP 10-8-23

DP 10-8-24

8/6/24

(X)

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150 Outsource3 Outsource process - Cad plate	Outsource process-Cadplate per QSI017 4.1.9.1 Memo Issue P/O: <u>12444</u> Stress relief at 375° for 5 hours Magnetic Particle Inspect per ASTM E1444 Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375° for 8 hours, Chromate Treat Possible Supplier: Southwest United Industries Ensure Certificate of Conformity is attached	0.00 0.00							<u>CZ 10/8/25 ①</u>
160 Packaging Packaging	Receive & Inspect for Damage & Mat'l Certs Memo Ensure certificate of conformity is attached	0.00 0.00							<u>C10/9/2 ①</u>
170 QC Quality Control	QC5- Inspect part completeness to step on W/O Memo	0.00 0.00							<u>ML 10 09 15 ①</u>

D70

Dart Aerospace Ltd

W/O: 60815		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
10/9/14	175	NDT per QSI 038 before + after Load testing per eng. This time only P/O: 12557	CL	10/9/14	①	10.9.14	S. blocks	
		need 4 inspect	P	14/9/14	①		S. blocks	

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Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180 	SprayPaint	0.00				<i>ml</i>	<i>10</i>	<i>09</i>	<i>15 ①</i>
SprayPaint	Memo	0.00							
Spray Painting	1-Prime inside crosstube as per QSI 005 4.2 2-Prime Outside of Tube as per Dart QSI 005 4.2								
190 	QC14- Inspect Spray Paint	0.00				<i>25</i>	<i>10</i>	<i>09</i>	<i>16</i>
QC	Memo	0.00							
Quality Control	Then, Wrap in plastic bag to protect from scratches								
200 	Crosstubes	0.00				<i>ml</i>	<i>10</i>	<i>09</i>	<i>16 ①</i>
Crosstubes	Memo	0.00							
Crosstubes	1-Install Ground wire Insert, then insert screw and washer 2-Install Abraison strips as per Dwg D350-748-141 & QSI 035. 3-Install supports Using Dt8876 as per Dwg D350-748-141, Torque to 60-80 IN-LBS								

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Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210

QC5- Inspect part completeness to step on W/O

0.00

0.00

QC

Memo

Quality Control

220

Pick Kit

0.00

0.00

Packaging

Memo

Packaging

230

QC4- 100% Inspect kits for completeness

0.00

0.00

QC

Memo

Quality Control

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Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

240

0.00



Packaging

Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D350-748-101

Location:

PPP Rev:

250

0.00



QC

Quality Control

QC21- Final Inspection - Work Order Release

Memo

0.00

10/9/2010

10/09/21

MF

10-9-21

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Picklist Print

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Parent Item Name: Crosstube Installation, High Fwd









Start Date: 7/23/2010

Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A New Issue 06-07-05 JLM
 IPP Rev:B Update qty of MS21042L5 06-09-12 KJ
 IPP Rev:C Rev B 07-11-15 DD
 IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD
 IPP Rev:E 08-06-24 revD as per dwg DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D350-748-141TRN  Crosstube Turning Detail		Manufactured	No			110	Each	1.0000	1	1			
 B59325 MB 10-08-18													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				LG		1							
					55295	1							
ALS4-1032-225  Insert		Purchased	No			200	Each	6,043.000	1	1			
 ml 10 09 16													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				PK011		6043							
					110768	6043							
AN960JD10  Washer	NAS1149D0363J	Purchased	No			200	Each	0.0000	1	1			
 ml 10 09 16													
D2856-400  Abraison Strip		Manufactured	No			200	f	361.0188	1.181	1.243158			
 ml 10 09 16													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				ST403		361.0188421							
					56626	145.018842							
					59920	216							

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Start Date: 7/23/2010

Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

D3502-1
Support
Manufactured No

200 Each

56.0000

2 2



m/ 10.09.16

Location

Loc Qty

Loc Code

ST066

56

47120

1

50287 x 1

38

52903 x 1

17

MS21920-20
Clamp (per MIL-DTL-8783C)
Purchased No

200 Each

103.0000

2 2



m/ 10.09.16

Location

Loc Qty

Loc Code

LG

103

112624

18

114687

35

114779

24

115057

26

MS27039-1-10
Screw
Purchased No

200 Each

133.0000

1 1



m/ 10.09.16

Location

Loc Qty

Loc Code

ST291

133

112794

33

112940

100

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Shop Packet Print

Page 2

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Start Date: 7/23/2010

Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

AN4-41A

Purchased

No

220

Each

290.0000

8

8

Bolt

Location

Loc Qty

Loc Code

ST360

290

111424

4

113359

86

114941

100

115108

100

AN4-6A

Purchased

No

220

Each

1,243.000

16

16

Bolt

Location

Loc Qty

Loc Code

ST356

1243

112933

96

113149

344

114523

2

114615

1

114941

500

115108

300

AN5-32A

Purchased

No

220

Each

228.0000

4

4

Bolt

Location

Loc Qty

Loc Code

ST340

228

113121

4

114056

74

114405

50

115016

50

115108

50

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Dart Aerospace Ltd

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AN960JD416 NAS1149D0463J Purchased No

Washer

220

Each

0.0000

32

32 6x

24

2x

M115000

M112314

M115662

AN960JD516 NAS1149D0563J Purchased No

Washer

220

Each

0.0000

8

8

M114742 10/9/17sf

D3500-1

Manufactured

No

220

Each

42.0000

4

4

10/9/17 sf

Saddle

Location

Loc Qty

Loc Code

ST424

26

59120

8

59422

18

ST425

16

55605

16

D3501-1

Manufactured

No

220

Each

406.0000

16

16

10/9/17sf

Bushing

Location

Loc Qty

Loc Code

ST066

406

45402

15

45918

112

48268

179

53779

100

16

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Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

MS21042L4

Purchased

No

220

Each

3,897.000

24

24



Nut



10/9/17 SP

Location

Loc Qty

Loc Code

ST300

3897

113422

68

114523

28

114718

23

114784

1778

115108

2000

MS21042L5

Purchased

No

220

Each

796.0000

4

4



Nut



10/9/17 SP

Location

Loc Qty

Loc Code

ST139

296

114813

296

ST300

500

115156

500

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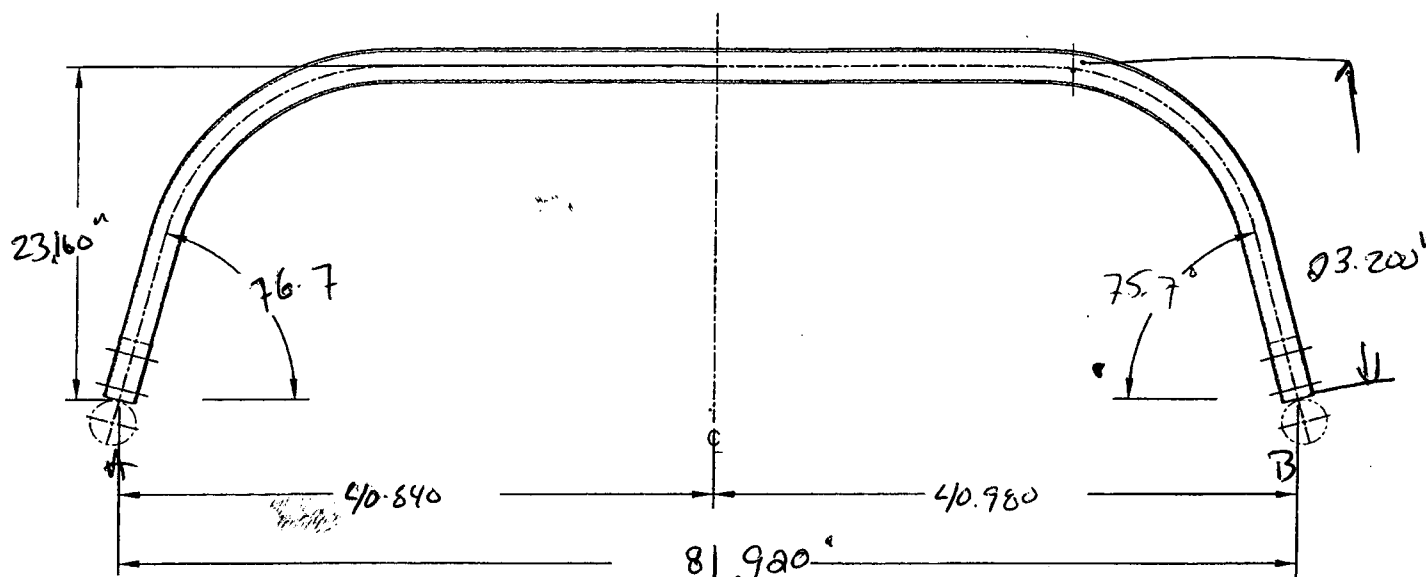
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DART AEROSPACE LTD		Work Order:	60815
Description: Crosstube High Fwd (AS350/355)		Part Number:	D350-748-101
Inspection Dwg: D350-748-141		Rev: D E	Page 1 of 1

B 10.08.18

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments
twist 0.159"
OK 10.08.20

QC15 Inspection	S
Date	10/08/20

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	[Signature]

Dart Aerospace Ltd

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Item	Qty	Part Number	Description
	-141		
1	X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6017-115	CROSSTUBE
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6017-115
FINISHED LENGTH = 110.270±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 30.45 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
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UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. *60815*
BS10-7-23

RELEASED
2009-10-29
JMP

E	REVISE GENERAL NOTES; UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); TOLERANCES (ZN C6-3, D1-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6017-115 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>JP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	<i>JP</i>	DRAWING NO.	REV. E
MFG. APPR.	<i>JP</i>	D350-748-141	SHEET 1 OF 4
APPROVED	<i>JP</i>	TITLE	SCALE
DE APPR.	<i>JP</i>	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

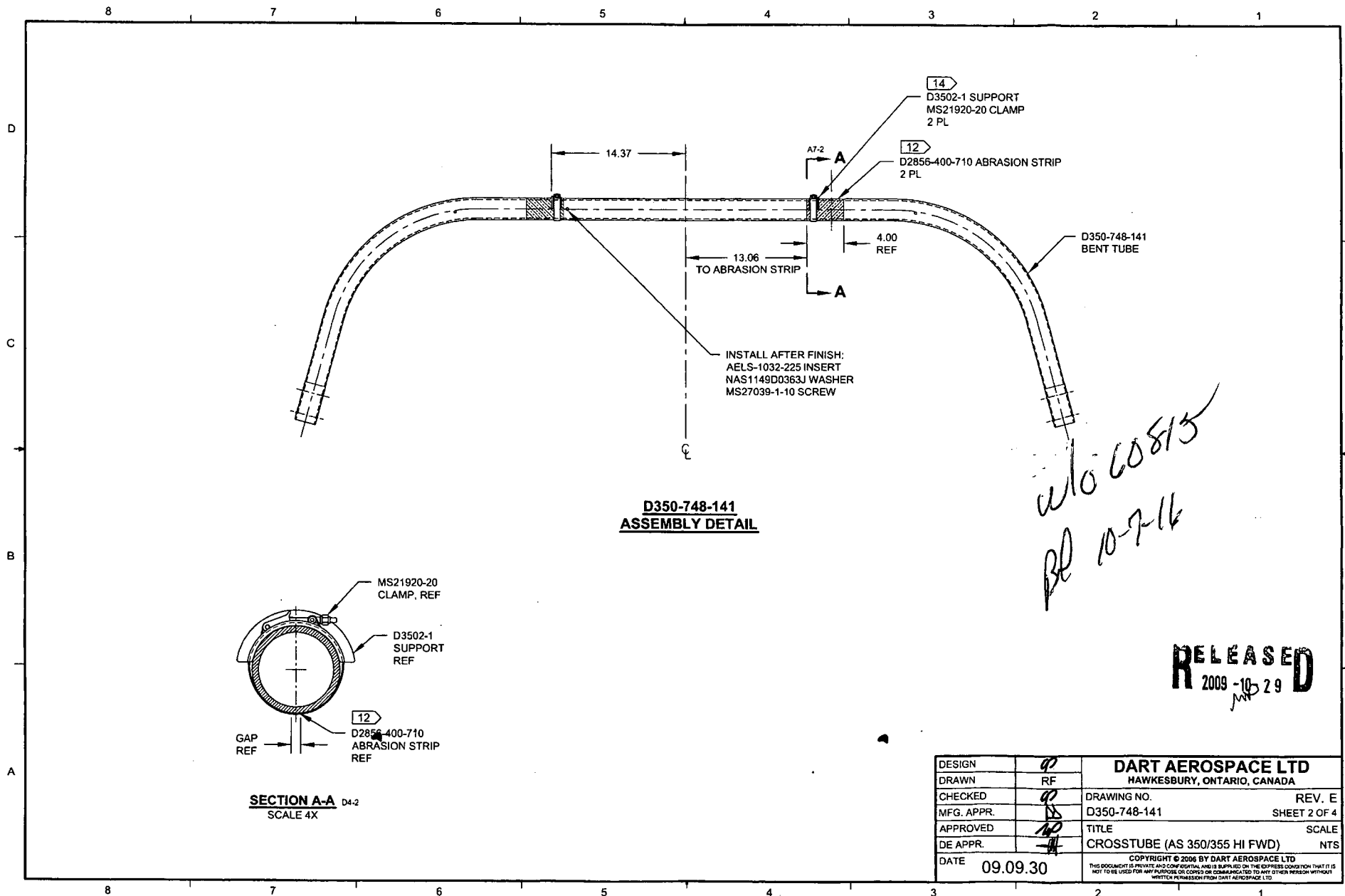
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



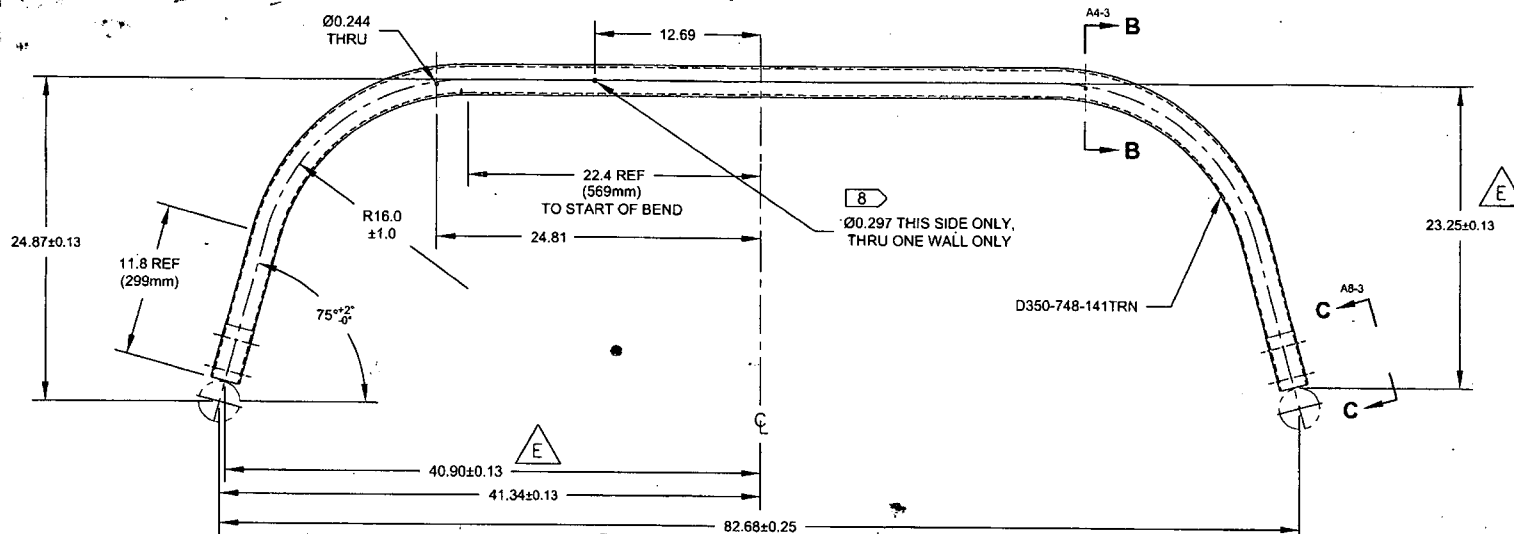
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

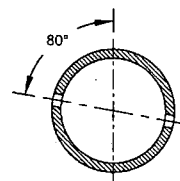
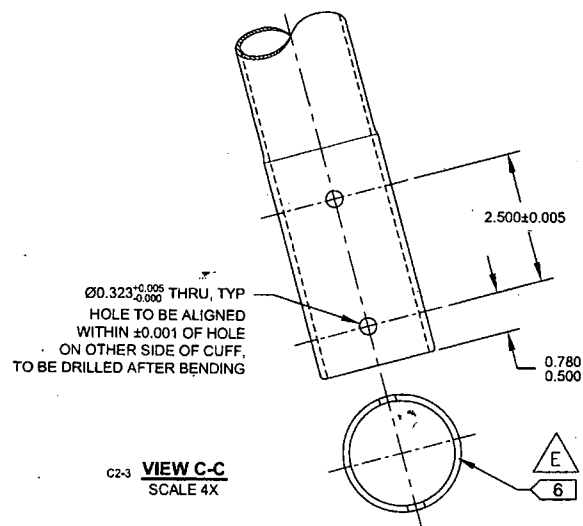
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



D350-748-141
BENDING AND DRILLING DETAIL 10



w/o 60815

RELEASED
2009-10-29

DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. E
MFG. APPR.	RF	D350-748-141	SHEET 3 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2006 BY DART AEROSPACE LTD	
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng/ Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Sep-03-2010

CONSIGNED TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 97978

INVOICE #: 51089

**CONTRACT OR
PURCHASE ORDER # PO12444**

DESCRIPTION: SKID

QTY 1

P/N # d350-748-101

S/N # B60815

**STRESS RELIEF BAKE @ 375 DEG. BAKE HEAT CHART #10-907.
MPI INSPECTED IAW ASTM-E-1444. CADMIUM PLATED IAW AMS-
QQ-P-416C, TYP2 YELLOW, CLASS 1. BAKE HEAT CHART #10-923.**

**CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.**

Approved Inspector:



A large, stylized handwritten signature in black ink, written over a horizontal line.



LIQUID PENETRANT TEST REPORT

P- 15189

CLIENT	DART Aerospace	DATE	Sept 13-2010	PAGE	1	OF	1
ATTENTION	LINDA/CHANTEL	ACUREN JOB No.	128-10-0858	TIME	AM	<input checked="" type="checkbox"/>	PM <input type="checkbox"/>
ADDRESS	1270 ADELPHI STREET. HAWKESBURY ON KOH 1K7	PO/NO No.	12444	WORK LOCATION	HAWKESBURY PLANT		
PROJECT	F.P.I. on CROSS TUBES	ACCEPTANCE STD.	ASTM 1417	REV./DATE	2007		
ITEM(S) EXAMINED	11						

JOB DESCRIPTION	PROCEDURE No. LT-0002	REV./DATE	—	TECHNIQUE No. LT-2442	REV./DATE	—
PART No.	—					
SCOPE	WET FLOWESCENT LIQUID PENETRANT INSPECTION CARRIED OUT 100% EXTERNAL.					

TEST DETAILS							
METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED		
FAMILY BRAND	MAGNAFLUX		BLACK LIGHT S/N	16459	<input type="checkbox"/> OUTPUT > 1000 μ W/cm ²	<input type="checkbox"/> AMBIENT < 2 fc	
PENETRANT	2LG7	MINIMUM DWELL TIME	45 MIN.	LIGHTING EQUIP.	<input type="checkbox"/> FLASHLIGHT	<input type="checkbox"/> TROUBLELIGHT	<input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER	H2O	MINIMUM DRY TIME	> 10 MIN.	OTHER	LAB. NO.		
DEVELOPER	SKD 52	MINIMUM DWELL TIME	10 MIN.	LIGHT METER S/N	1098866	CAL DUE DATE	Oct 7-11 2010
DEVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY				

TEST SURFACE					
SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < - 4°C/ 20°F	<input type="checkbox"/> - 4°C/ 20°F TO 10°C/50°F	<input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F	<input type="checkbox"/> > 52°C/125°F	

RESULTS- (☐ METRIC ☐ IMPERIAL)

1 - Cross Tube W.O. 59905 ✓	- EXAMINATION WAS COMPLETED PRIOR TO DEFLECTION TESTING 10 08 15
1 - Cross Tube, W.O. 60815 ✓	
1 - Cross Tube, W.O. 59907 ✓	
1 - Cross Tube, W.O. 60816 ✓	
1 - Cross Tube, W.O. 59905 ✓	
1 - Cross Tube, W.O. 60820 ✓	
1 - Cross Tube, W.O. 60821 ✓	
1 - Cross Tube, W.O. 60822 ✓	
1 - Cross Tube, W.O. 60817 ✓	
1 - Cross Tube, W.O. 60818 ✓	
1 - Cross Tube, W.O. 59904 ✓	
1 - Cross Tube, W.O. 59906 ✓	

Scope of Services
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES		DTR #	E63387
CLIENT REPRESENTATIVE	John Tiffley	REPORT REVIEWED BY:	
TECHNICIAN (SIGNATURE):	Mike Jettus	NAME	INITIALS
NAME (PRINT):	Mike Jettus		
CGSB LEVEL	I SNT LEVEL	CGSB LEVEL	SNT LEVEL
CGSB REG. No	6606	CGSB REG. No	



LIQUID PENETRANT TEST REPORT

P- 15191

CLIENT	<u>DART Aerospace</u>	DATE	<u>SEP 13-2010</u>	PAGE	<u>1</u> OF <u>1</u>
ATTENTION	<u>LINDA/CHANTEL</u>	ACUREN JOB NO.	<u>188-10-0838</u>	TIME	AM <input checked="" type="checkbox"/> PM <input type="checkbox"/>
ADDRESS	<u>1270 ABELDEEN STREET</u>	PO/NO.	<u>12444</u>		
	<u>HAWKESBURY, ON.</u>	WORK LOCATION	<u>HAWKESBURY PLANT.</u>		
	<u>KOH IK7</u>	ACCEPTANCE STD.	<u>ASTM 1417</u>	REV./DATE	<u>2007</u>
PROJECT	<u>F.P.I.</u>		<u>ON</u>		
ITEM(S) EXAMINED			<u>CROSS TUBES</u>		
			<u>12</u>		

JOB DESCRIPTION	PROCEDURE NO., LT <u>0002</u>	REV./DATE	<u>-</u>	TECHNIQUE NO. LT <u>1417</u>	REV./DATE	<u>-</u>
PART NO.	<u>-</u>	MATERIAL	<u>STEEL</u>	THICKNESS	<u>-</u>	
SCOPE	<u>WET FLOUORESCENT LIQUID PENETRANT</u> <u>INSPECTION CARRIED OUT 100% EXTERNAL</u>					

TEST DETAILS					
METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND	<u>MAGNAFLUX</u>		BLACK LIGHT S/N	<u>16459</u>	<input type="checkbox"/> OUTPUT > 1000 μ W/CM ² <input type="checkbox"/> AMBIENT < 2 fc
PENETRANT	<u>2L07</u>	MINIMUM DWELL TIME	<u>45</u>	MIN.	LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER	<u>#20</u>	MINIMUM DRY TIME	<u>>10</u>	MIN.	OTHER <u>LAB. NO</u>
DEVELOPER	<u>SKD 52</u>	MINIMUM DWELL TIME	<u>10</u>	MIN.	LIGHT METER S/N <u>1098866</u> CAL DUE DATE <u>OCT 19 2010</u>
DEVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY		

TEST SURFACE					
SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input checked="" type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/ 20°F	<input type="checkbox"/> -4°C/ 20°F TO 10°C/50°F	<input type="checkbox"/> 10°C/50°F TO 52°C/125°F	<input type="checkbox"/> > 52°C/125°F	

RESULTS- (<input type="checkbox"/> METRIC <input type="checkbox"/> IMPERIAL)	
<div><div><div>1 - CROSS TUBE W.O. 59905 ✓</div><div>1 - CROSS TUBE W.O. 60815 ✓</div><div>1 - CROSS TUBE W.O. 59907 ✓</div><div>1 - CROSS TUBE W.O. 60816 ✓</div><div>1 - CROSS TUBE W.O. 60820 ✓</div><div>1 - CROSS TUBE W.O. 60821 ✓</div><div>1 - CROSS TUBE W.O. 60822 ✓</div><div>1 - CROSS TUBE W.O. 60817 ✓</div><div>1 - CROSS TUBE W.O. 60818 ✓</div><div>1 - CROSS TUBE W.O. 59904 ✓</div><div>1 - CROSS TUBE W.O. 59906 ✓</div></div></div> <div><div>- EXAMINATION WAS COMPLETED</div><div>* AFTER DEFLECTION TESTING</div><div>M/ 10 09 15</div></div>	

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SIGNATURES		DTR # <u>E6 3387</u>
CLIENT REPRESENTATIVE	<u>[Signature]</u>	
TECHNICIAN (SIGNATURE):	<u>[Signature]</u>	REPORT REVIEWED BY:
NAME (PRINT):	<u>Mike [Signature]</u>	NAME INITIALS
	1 st TECHNICIAN	2 nd TECHNICIAN
CGSB LEVEL	<u>#</u> SNT LEVEL	CGSB LEVEL SNT LEVEL
CGSB REG. No	<u>6606</u>	CGSB REG. No